

**DRAWINGS:**

Page 4 containing FIGS. 11 and 12 has been added to the drawings and is enclosed with this Amendment.

## **ARGUMENTS/REMARKS**

### **Amendments to the Claims**

Claims 1-10, 12-19, 21 and 22 are pending in the application. With this Amendment, claims 1 and 5 have been canceled, claims 2-4, 6-10, 12-19, and 21-22 have been amended, and new claims 23-40 have been added to further define the invention. No new matter has been added and the amendments are fully supported within the specification and drawings as filed. Reconsideration of the application is earnestly solicited.

### **Amendments to the Drawings**

The drawings have been objected to under 37 C.F.R. §1.83(a). The Examiner states that the features of claim 22 must be shown in the drawings or canceled from the claims.

Figures 11 and 12 are submitted with this Amendment containing the subject matter claimed in claim 22, namely that the top of the head of securing element 340 is flush mounted or recess mounted on face surface 350 of blade 338. The features of claim 22 are described in the specification on at least page 17, third full paragraph continuing onto page 18. Figures 11 and 12 show, respectively, the top of the head portion of the securing element flush mounted and recess mounted in relation to the blade face surface. Accordingly, removal of the 37 C.F.R. §1.83(a) rejection is earnestly solicited.

### **Rejections**

Claim 21 has been amended to remove the word "out" to clarify that the securing element has a head portion that extends from the blade surface a first distance less or equal to a second distance as defined. Accordingly, claim 22 is a narrower version of claim 21, wherein the extension of the head creates flush mounting or recess mounting of the head end in relation to the blade face, such as shown in FIGS. 11 and 12. It is respectfully submitted that claim 22 meets the requirements under 35 U.S.C. §112, first paragraph, as the flush mounted or recess mounted head end portion indeed extends

less than or equal to the second distance as claimed in independent claim 21. The arrangement is set forth and enabled in the third full paragraph on page 17 continuing onto page 18.

Claims 1-10, 12, 14 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hillestad (U.S. Patent No. 5,542,177) in view of Carlson et al. (U.S. Patent No. 4,691,600). Claims 13, 15, 17-19 and 21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hillestad (U.S. Patent No. 5,542,177) in view of Carlson et al. (U.S. Patent No. 4,691,600) and further in view of Ueda et al. (U.S. Pub. No. 2004/0234349).

It is respectfully submitted that the cited references cannot teach or suggest the present invention as claimed.

Method claims are presented in claims 2-4, 6-9 and 23-33. New independent claims 23 and 25 relating to a method for preparing a tube end are submitted herewith in order to further define the invention. Independent claim 23 includes a step of providing a rotary milling tool comprising a milling head adapted to at least remove a predetermined amount of tube material from an outer surface of a tube. The rotary milling tool further includes an arbor and a securing device attached to the arbor. According to the claim, the method includes securing the arbor of the milling tool in the tube with the securing device. The arbor is described in the specification on page 13, first full paragraph continuing onto page 14. Lines 9 and 10 of the paragraph state that the arbor is preferably removably secured within the tube utilizing a securing device such as a collet 52. As stated at the bottom of page 13 beginning at the penultimate line, collet 52 and arbor 50 remain stationary in the tube while the milling tool is engaged and the milling head rotates about the shaft while performing its machining operation. The machining or milling operation is also claimed in independent claim 23, wherein the outer surface of the tube is milled with a milling head and tube material is thus removed from the outer surface of the tube while the arbor remains stationary in the tube when the milling head rotates about the arbor. Claim 25 contains similar limitations with respect to the milling head and arbor connected to the rotary milling tool.

The Hillestad reference, as admitted by the Examiner, fails to teach a milling head for removing an outer radial thickness of the tube. The Hillestad reference also

lacks the claimed limitations of securing the arbor of the milling tool in the tube, and also milling the outer surface of the tube with the milling head while the arbor remains stationary in the tube while the milling head rotates about the arbor. As stated in column 6, lines 8-37 of Hillestad, pilot rod 50 is inserted into a tube end opening before and during the milling operation and is cylindrical and aligned coaxially with the rotational axis of the milling head 20. The pilot rod 50 is preferably removably secured within bore 33 of milling head 20 such as by set screw 53 received in a threaded bore 45, or by providing threads at one end of pilot rod 50 which mate with threads of bore 33. The diameter of the pilot rod is only slightly smaller than the inner diameter of the tube to prevent jerking of the tool during the milling operation and to ensure accurate milling of the membrane, thereby preventing removal of material from the tube wall. Thus, as also shown in FIG. 9, Hillestad arbor 250 co-rotates with the milling head. Hillestad does not teach securing of an arbor in the tube with a securing device and milling the outer surface of the tube while the arbor remains stationary in the tube while the milling head rotates about the arbor.

Likewise, the Carlson reference includes mandrel 33 which as stated in column 3, lines 31-45, extends forwardly from base 19 of the tool holder. As also illustrated in FIG. 5 and further described in Column 3, lines 46-52, bolts 37 secure the rear end of mandrel 33 to base 19. Shaft 41, which rotates when power unit 16 is activated, is fastened to mandrel 33 by set screw or similar fastener 42. Mandrel 33 is thus co-rotatable with the tool holder. Mandrel 33 has an outer cylindrical surface 34 having a size to fit into passage 14 of pipe 11 with a sliding fit relationship relative to the inside wall of pipe 11. As further stated in column 4, lines 2-10, power unit 16 and shaver 10 are moved toward pipe 11 with mandrel 33 moving into pipe passage 14. Thus, the Carlson reference teaches away from Applicant's claimed securing the arbor of the milling tool in the tube with a securing device. Carlson also teaches away from maintaining the arbor in a stationary position while the milling head rotates about the arbor.

The Ueda reference does not add any further teaching or suggestion in order to render the present invention obvious. The Ueda reference teaches small scale indexable inserts of a high pressured sintered material that are reportedly readily and

securely mounted by means of a clamping screw onto a tool holder, which provides for shortened set up time, improved machining precision, and enhanced mounting reliability, see Abstract. The Ueda reference cannot teach or suggest the specifically claimed rotary milling head for a rotary milling tool having the structure defined within the claims of the application including one or more cutting blades configured as claimed that are adapted to remove material from an outer radial diameter or thickness of a tube.

It is thus respectfully submitted that the method claims are allowable in view of Hillestad, Carlson and Ueda. Any modification of the references and/or citation of other references can only be done using impermissible hindsight.

Claims 10, 12-19 and 21-22 relate to a milling head for a rotary milling tool. On page 5, third full paragraph, the Examiner states that since the Hillestad reference teaches cutting sweep that has an outer radius that is greater than the outer radius of a tube, Hillestad's milling head is capable of removing any weld overlay from the surface of the tube. This is incorrect. Weld overlay is different than membrane, with membrane 16 generally located between adjacent tubes as shown in FIG. 1. In contrast, weld overlay 17 as shown in FIG. 1 generally covers more surface area on the outer diameter of a tube and typically covers one side of a tube outer diameter between adjacent membranes. The Hillestad reference does not teach weld overlay removal and no one could infer such a teaching.

Moreover, the Hillestad reference does not teach or suggest Applicant's claimed milling head structure set forth in the milling head claims including a blade having a countersink around said bore and receiving at least a portion of a head of the securing element. The configuration of the cutting blades with respect to the milling head body, as claimed in independent claims 10 and 21, allow the milling head of the present invention to mill the tube outer diameter as well as any weld overlay or membrane present on the outer surface of the tube, in contrast to the structure set forth in the Hillestad reference.

The Carlson reference relates to a pipe shaver reportedly operable to remove material from the outer surface of an end section of a plastic pipe or similar tubular member, see column 1, lines 54-57. The Carlson reference and the present application

address different problems in different fields. As stated in Carlson, Background of the Invention, Carlson is directed to pipes made of reinforced plastic used to carry fluid, such as liquids and gases. Elongated lines of plastic pipe utilize fittings, couplings and elbows to secure pipes in end-to-end relationship. The integrity of the joint is reportedly enhanced when the mating surfaces of the plastic pipe and coupling have close tolerances which are achieved by shaving the outer end of the plastic pipe to provide a smooth uniform diameter cylindrical surface. Antipodally, the problem of the present invention involves the preparation of tube ends of metal pipes which are not joined together by fittings, couplings, or elbows but rather by a subsequent welding operation. The milling head of the present invention must have a structure to be able to remove material from the outer surface of the tube itself, as well as any weld overlay and/or membrane present and cannot, as claimed, be taught or suggested by the Carlson reference.

Independent claims 10 and 21 relating to milling heads have been amended to further define that the outer diameter milling blade has a lower cutting edge that extends below a lower end of the body in order to mill the tube outer diameter and any weld overlay or membrane present on the tube within the annular cutting sweep. The claimed feature is clearly shown in FIG. 8, wherein blade 338 includes lower cutting edge 344 that extends below cutting blade support 326. A further description is found in the specification on page 17, first full paragraph through page 18, first full paragraph.

The Carlson reference teaches away from Applicant's claimed configuration. The Carlson reference would not be able to remove or mill any membrane or weld overlay present on an outer diameter surface of a tube. As clearly illustrated in FIGS. 1, 5 and 7 of Carlson, lugs 22, 23 and 24 of the tool body extend below tool 26 that is a circular metal cutting disk, see column 3, lines 9-10. As illustrated in FIG. 5, lugs 22, 23 and 24 of sidewall 21 have very close tolerances to a pipe outer diameter to be shaved, such as shown in FIG. 5. As such, Carlson lugs 22, 23 and 24 which are not cutting blades, but only a part of body 18, would contact any weld overlay or membrane present on the outer surface of the tube and, thus, prevent cutting of the same, as well as any outer diameter of the tube since cutting tool 26 would be located above the top of the tube, by



lugs 22, 23, and 24 in contact with membrane and/or weld overlay, and thus not be able to come in contact with the outer diameter of the pipe 11.

As stated previously, there is no teaching or suggestion within the Ueda reference for a milling head utilized to remove an outer radial thickness from an annular tube, as well as any weld overlay present, as claimed in association with the additional structure presented within the claims of the invention.

It has not been shown that a person of ordinary skill in the art, seeking to solve the problem of removing material from the outer diameter or surface of a tube, as well as any weld overlay present thereon, would reasonably be expected to look to the Hillestad, Carlson, and Ueda references and combine the same to arrive at the claimed present invention. The combination of elements presented, in a manner that reconstructs the Applicant's invention only with the benefit of hindsight, is insufficient to present a prima facie case of obviousness. There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge cannot come from the Applicant's invention itself. The mere fact that prior art may be somehow modified or altered in the manner suggested by the Examiner does not make the modification or alteration obvious unless the prior art suggests the desirability of the combination. That, it respectfully does not.

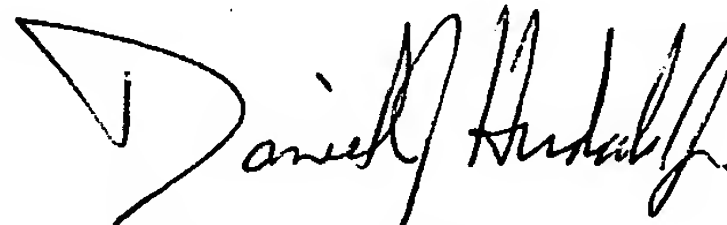
The newly submitted independent claim 35 relates to a rotary milling tool comprising a rotary milling device, a milling head operatively connected to the rotary gearing of the milling device and capable of removing material from the outer diameter of a tube as well as any weld overlay or membrane present on the outer diameter, and an arbor that extends through a bore in the milling head and is connected to the rotary milling device so that the arbor remains stationary when the milling device is activated and milling head rotates.

As described hereinabove with respect to the method claims, the cited references teach away from the claimed structure of the rotary milling tool. One embodiment of the claimed invention is illustrated in FIG. 5 and described in the specification on page 13, first full paragraph, and page 17, first full paragraph through page 19.

It is respectfully submitted that the claims are in condition for allowance and a Notice of such is earnestly solicited. Should the Examiner have any questions or concerns regarding this response, a telephone call to the undersigned is greatly appreciated in order to expedite allowance of the application.

Respectfully submitted,

HUDAK, SHUNK & FARINE CO. LPA

A handwritten signature in black ink, appearing to read "Daniel J. Hudak, Jr.", with a stylized, cursive script.

Daniel J. Hudak, Jr.  
Registration No. 47,669

DJHjr/js

2020 Front Street, Suite 307  
Cuyahoga Falls, OH 44221  
330-535-2220

Atty. Docket No.: H&S-L